SHOUT
SHARE
IT

BULLETIN

— OF THE —

British Columbia Entomological Society

EDITED BY R. V. HARVEY, M. A. VANCOUVER, B. C.

QUARTERLY SEPTEMBER, 1907 No. 7

(Continued from last Issue.)

BRITISH COLUMBIAN FLEAS.

There is in the possession of the President of our branch a copy of a Monograph of the Fleas of the World, written by Professor C. F. Baker, and published in the Proceedings of the U. S. National Museum.

It is a very complete work of 107 pages, illustrated with 17 plates, and in it are listed 135 species, arranged in five families grouped together in the order, Siphonaptera, or, as we used to call it, following Kirby & Spence and Westwood, the Aphaniptera.

The first four families of the order are very small, containing only five species in all, and none of these are British Columbian, or likely to be found here.

The fifth family is styled Pulicidae, and six species out of the 130 seem to be members of our fauna. These are:—

1. **Pulex irritans Linn.**
2. **Ctenocephalus canis Curtis.** (On dogs and cats).
3. **Ceratophyllus gallinae Schrank.** (On poultry).
4. **C. charlottensis Baker.** (In a mouse nest).
5. **C. keeni Baker.** (On Peromyscus keeni).
6. **C. perpinnatus Baker.**

The last three were all discovered by the very energetic entomologist, the Rev. J. H. Keen, Church of England Missionary, formerly of Masset, Q.C.I., and now residing at Metlakatla.

NOTES ON BREEDING LEPIDOPTERA.

By J. W. Cockle, Kaslo, B. C.

Part II. Larvae.

Upon the emergence of the young larva the first requisite is to provide them with food, and where the food-plant is unknown this often proves difficult. The usual method is to introduce a variety of leaves into the breeding-jar, trusting in this way to find something that they will eat. If after the lapse of a few hours the larvae have refused to eat what has been offered, another lot of leaves should be introduced,—anything that suggests itself as likely should be tried. Trouble of this nature may often be avoided if the eggs are obtained from a female that was captured by beating. It will be found an almost invariable rule that when a moth is ovipositing it will rest on or near the food-plant, and a record of the plant or trees from which the parent was dislodged should always be kept.

Great care must be used in changing very young larvae from a faded leaf to a fresh one; if they are not readily removable with a camel-hair brush, it is advisable to place another leaf over them until the next day, when the few remaining on the old leaf may be picked off; or a small piece of leaf to which the abdominal props are attached may be cut away and removed with the larva. Observation as to the stages of moulting should be carefully noted, as this is a very critical time with larvae, and any disturbance of them after they have attached themselves for shedding their skin is likely to result in their death.

In feeding broods of noctuid larvae, which will usually eat anything, preference should be given to the less juicy foliage, because they will be more easily kept clean, and be less subject to fungoid diseases.

When large broods are desired the bag method,—of placing the brood on a limb of the food-plant—is preferable to attempting to feed them in confinement, but a few of the same brood may be kept in jars for examination.

In dealing with wild larvae, any that are solitary in their habits must be kept in separate jars or boxes, as they are liable to become cannibals if kept together, and a cannibal larva rarely reaches maturity.

The care of hibernating larvae is the hardest task of the breeder, so little is known of the conditions favorable to their safety. The best success I have had in dealing with these larvae has been to place them in a box of straw, and then place the box out of doors in a moderately dry place. Do not disturb them in the spring until their food-plant is well grown and the weather is warm.

Amongst the curious instances of food-plants are recorded cases where the young larvae refused to eat fresh green leaves, but subsequently ate the same leaves after they had withered; this would denote that they eat the damp fallen leaves under the trees.

Referring to Dr. Dyar's request in the June Bulletin for breeding notes on **Xylomania**—I find that my notes on **X. rubrica** give wild cherry and aspen poplar as the food-plant of this species. This should form a key to the probable food-plants of other members of this family.

NOTES ON THE DISTRIBUTION OF INSECTS IN BRITISH COLUMBIA.

By R. V. Harvey.

(Conclusion.)

In the last issue I selected the Dipterous Family Syrphidae to illustrate the peculiar relationship which exists between the insect fauna of the White Mountains of New Hampshire and that of Europe on the one hand and British Columbia on the other.

It is only fair to add that this relationship is by no means so well marked in other families of this order. To take only those families of which lists have been published in this Bulletin: In the Asilidae only five of our species seem to be found in the East, but three of these occur on the White Mountains; in the Bombyliidae about 50 per cent. of our species are generally distributed over the continent of North America; the rest are confined to the Pacific slope; in the Tachinidae no less than 80 per cent. are also Eastern species; of our Tabanidae about 30 per cent. are either Eastern or Arctic species.

Now while the distribution east and west seems to point to a common origin of the fauna of North America in a circumpolar region of pre-glacial times, the facts of their distribution north and south are susceptible of the same explanation. To begin with, the affinities of our fauna with that of Alaska are most noteworthy, and those of our butterflies which are common to the Western United States are there found to be usually alpine in their habitat. The following are mountain species in California and Colorado: **Vanessa californica, V. milberti, Thecia californica, Pamphila mandan,** and **Erynnnis manitoba,** most of which occur at altitudes of four to eight thousand feet in those states, as recorded by Mr. Greenwood Wright.

But perhaps the most notable examples of species occurring at higher altitudes as they range south are to be found among the Bombidae, or Humble-Bees. The report of Dr. W. H. Ashmead on the Harriman Alaska expedition of 1899 contains some interesting facts bearing on our subject. He notes a general affinity between the Alaskan species and those of Eurasia on the one hand and of British Columbia and Washington on the other. Of seventeen species of Bombus recorded by him, no less than ten are known to occur in British Columbia. Only four are noted as found in the United States, and the distribution of these is instructive: 1. **Bombus nevadensis** occurs in the interior plateau of British Columbia, but is alpine in Nevada, Utah and Colorado; 2. **Bombus sitkensis** flies at sea-level in British Columbia, but in Colorado and New Hampshire must be sought on the highest peaks; 3. **Bombus frigidus** is said to fly throughout British Columbia (Ashmead), but is a mountain species in Colorado and New Mexico; 4. **Bombus nearcticus** ranges from the mountains of British Columbia to those of Idaho and California.

Let us now consider more closely the distribution of the insects within the limits of our own province. The physical features of the country, the north and south trend of the chief mountain ranges, divide the province up into four well-marked regions, differing to a considerable degree in climate and surface. First we have Vancouver Island, or rather the southern portion of it, where the climate is very mild and fairly dry; second, the Lower Mainland, which should include the north end of the Island and all the coast west of the Cascade Mountains. This is the rainy region, where the vegetation is very dense; it contains the best timber in the province; third, the Dry Belt, comprising the districts round Kamloops, the Okanagan, Similkameen and Boundary country, characterized by a very low rainfall and colder winter; fourth, the Kootenays and Rocky Mountains region.

The last named region seems to be the richest in insects, while the heavily timbered Lower Mainland is the poorest. The first two agree in the general aspect of the fauna, and the last two also show many points of similarity.

But the point I wish to emphasize is not the similarity, but the dissimilarity between these four regions. Let me take a few concrete examples.

Parnassius clodius is a coast species ranging commonly up to Mount Cheam, where it overlaps the range of its congener **P. smintheus,** the inland species. **Clodius** has, however, been recorded as far east as Greenwood, in the Boundary district, while **smintheus** is found near latitude 57 on the Stikine River, nearer the coast.

Papilion daunus seems to be confined to the Dry Belt, and **oregonia** is not found on the coast. **Lemonias cooperi** and **whitneyi** range from Victoria up to the confines of the Dry Belt, where their places are taken by **L. palla** and **L. macglashani.**

Phyciodes mylitta is limited to the Lower Mainland, and in the interior is represented by **P. barnesii.**

Eugonia j-album is apparently absent on the Island, and **Polygonia silenus** has not been recorded from the interior as yet.

Coenonympha ampelos is abundant around Victoria, absent in the Lower Mainland, but reappearing again in Similkameen with slight varietal differences.

Oeneis gigas is common on the Island, where it is not (pace Mr. Greenwood Wright), confined to "bare rocky knobs" in that "inhospitable locality"! It has been taken on Grouse Mountain, near Vancouver, at 4000 feet, but in the Cascades and further east we take only its near ally **O. chryxus.**

When we look at the range of these same species in the States to the south of us, we find no such well-marked regions; species like **P. clodius, P. smintheus** and **Phyciodes mylitta** are found from the coast to the Rockies.

Now while these cases, and, many others that might be added, may be fairly well accounted for by the theory of (1) a common circumpolar origin, (2) a southward migration in the glacial period, followed by (3) a return northward at the close of that period, still there are whole series of facts in distribution which seem to conflict with it. Some of these facts have been already alluded to above, and others will no doubt occur to those who have made special studies in orders not referred to in this paper. I think, however, that the array of facts bearing out the approximate truth of this theory will outweigh those which at first sight seem to be to some extent against it.

THE B. C. LEPIDOPTERA LIST.

(Additions.)

34	**Pontia sisymbri Bdv.**	Kaslo
70b	**Eurymus alexandra, var emilia Edw.**	Kaslo and Boundary
159	**Lemonias editha Bdv.**	Boundary
370	**Callipsyche behrii Edw.**	Boundary
526	**Polites peckius Kby.**	Kaslo; one specimen
	Fishea yosemitae	Kaslo
	Fishea exhilarata	Kaslo
1520	**Chorizagrotis sorer Smith**	Kaslo
1686	**Paragrotis numa Strecker**	Kaslo
	Paragrotis quinto Smith (M. S.)	
1965	**Heliophila diffusa Walker**	Kaslo
1983	**Heliophila calgariana Smith**	Kaslo
	(Note.—The coast species formerly going under this name in our collections is **H. roseola Smith**).	
	Perigrapha achsha	Kaslo; one specimen
	Orthosia acta Smith (ms)	Kaslo
2504	**Autographa v-alba Ottol**	Kaslo

LOCALITY NOTES.

193 **Phyciodes mylitta Edw** has been recorded from the Boundary district.
401 **Chalceria snowii Edw** is an alpine species.
404 **Cupido heteronea Bdv**; Okanagan and Boundary; not Kaslo.
728 **Marumba modesta Harr**; from Kaslo and Nelson.
881b **Apantesis ornata, var ochracea Stretch**; from Kaslo.
2479a **Euchalcia festucae, var putnami Grote** occurs as far west as Vernon.

SOME OF OUR NOCTUIDAE.

By R. V. Harvey.

No. 2.—Plusia, and allied genera.

The species formerly grouped under this name have been rearranged, and the genus subdivided recently by Dr. Dyar, whose arrangement has been accepted by Dr. Ottolengui, of New York, who has made a special study of this group.

The old genus Plusia is now divided into six genera, four of which are represented in British Columbia, namely—Plusia (2 species); Euchalcia (1 species); Eosphoropteryx (1 species); Autographa (17 species).

These four genera are separated as follows:—

Plusia has short palpi; the fore-wings decidedly falcate, with a distinct tooth at the anal angle.

Euchalcia has the fore-wings not falcate, and scarely any tooth at the anal angle.

Eosphoropteryx has long palpi and narrow wings, with a tooth at the anal angle.

Autographa has the fore-wings not falcate; the outer margin scalloped, and a moderate tooth at the anal angle.

Genus **Plusia. Hubner.**

1. **aereoides Grote.** The fore-wings are almost uniform golden-brown, tending towards pinkish at the outer margin; the Y-mark is absent, but the cross-lines are distinct, the outer line being bright golden.
   Not common; recorded from Wellington, Agassiz and Kaslo.
2. **metallica Grote** (scapularis H. Edw.) Much larger than the last; the fore-wings are golden-brown, with a subapical buff patch and buff outer margin. The mark is roughly crescentic, large, silvery and solid; below it is a patch of golden-brown. Fresh specimens have a brilliant metallic sheen.
   Generally distributed, but not common.

Genus **Euchalcia. Hubner.**

putnami Grote. This is considered by many to be the American race of the European festucae, which it strongly resembles. Its popular name is the "Gold spot," and it is one of the most brilliant of our species. The head and collar are orange, the thorax purplish. Fore-wings purplish; and orange costal patch near base; a golden metallic subapical streak. The Y-mark is large, oblique, sometimes broken in two, the upper half always solid. Below is a quadrate orange-yellow patch with metallic sheen.
Common on the Coast; recorded from Nanaimo.

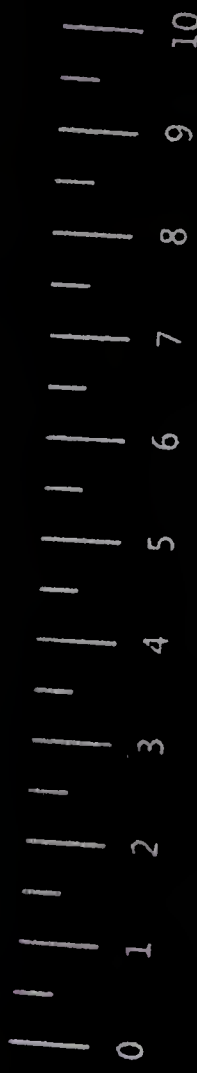
Genus **Eosphoropteryx Dyar.**

thyatiroides Guenee. Thorax thickly tufted; wings slightly pointed. Fore-wings greenish-grey, suffused in places with pink; a pink blotch at base. Y-mark distinct, silvery, broken.
Mission, Wellington; rare.

Genus **Autographa Hubner.**

1. **mappa Grote & Robinson.** Ground color dull pink with brown shades and brown cross-lines, picked out with black. Y-mark golden, broken; upper half a wide V, lower nearly circular.
   Fairly common on the coast; recorded from Sandon and Kaslo.
2. **flagellum Walker.** A northern species, which seems to be found throughout Canada; figured in Holland's Moth Book.
   Recorded from Kaslo. (1 specimen).
3. **pseudogamma Grote.** Closely allied to the next species, but the ground color is pure grey, without a trace of blue; darker markings rich brown.
   Kaslo, Hope Mountains, Stikine River.
4. **californica Speyer.** Our commonest species; a large insect with pointed wings; ground color blue-grey, with brown shades. Y-mark silvery, unbroken as a rule, oblique.
   A day-flying species, common everywhere.
5. **brasscae Riley.** A very injurious species, known as the Cabbage Looper; common throughout North America; figured in Holland's Moth Book and many other works.
   Kaslo.
6. **rectangula Kirby.** A small species, grayish in ground color, with all lines and shading sepia-brown. Medium shade dark, sharply defined by white lines. Y-mark large, unsilvered as a rule, very variable and often fantastic in outline. No anal tooth.
   Generally distributed, but not common.
7. **uaureum Guenee.** A doubtful record, received from the Interior.
8. **vaccinii H. Edw.** An eastern species, figured in Holland's Moth Book; may be distinguished by the heavily checkered fringe of the fore-wings. This name, with **celsa** and **octoscripta**, may refer to one species.
   Kaslo.
9. **selecta Walk (viridisignata Grote).** A large species with pointed wings. Ground color an almost uniform blue-grey; Y-mark of a peculiar greenish-golden hue. Anal tooth large.
   Vancouver Island; Kaslo; Hope Mountains.
10. **octoscripta Grote.** A small species, blue-grey suffused with brown; lines distinct, mostly double. Y-mark stumpy, unsilvered, unbroken, the lower half round with a dot in the middle. This species seems to have been going under the name of **celsa H. Edw.**, in some of our collections and there may be some confusion between the two.
    Island and Lower Mainland; not common.
11. **epigaea Grote.** A fairly large species, uniform light grey. Y-mark slender, silvery, inconspicuous; below is a dark brown blotch, fading into the ground color on the inner margin. Anal tooth large.
    Generally distributed.

(To be continued.)



R
ARCHIVE
ERNET